



## **Predictive Risk Factors for Post Tonsillectomy Hemorrhage in Children**

**Amrat Kumar<sup>1\*</sup>, Ghulam Shabir Mehar<sup>2</sup>, Junaid Hussain<sup>3</sup>, Ahmed Ali<sup>4</sup>,  
Abdul Waheed<sup>5</sup> and Dileep Kumar<sup>6</sup>**

<sup>1</sup>ENT Department, Isra University Hyderabad, Pakistan.

<sup>2</sup>ENT Department, Ghulam Muhammad Mehar Medical College Sukkur, Pakistan.

<sup>3</sup>Department of ENT, Pir Abdul Qadir Shah Jeelani Institute of Medical Science Gambat, Pakistan.

<sup>4</sup>ENT Department, Khairpur Medical College, Khairpur Mir's, Pakistan.

<sup>5</sup>ENT Department, KVSS Hospital Karachi, Pakistan.

<sup>6</sup>ENT Department, Peoples University of Medical and Health Sciences Nawabshah, Pakistan.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JPRI/2021/v33i29B31587

#### Editor(s):

(1) Dr. Rafik Karaman, Al-Quds University, Palestine.

#### Reviewers:

(1) Malina Jordanova, Space Research and Technology Institute, Bulgarian Academy of Sciences, Bulgaria.

(2) Fernando Cordera, ABC Medical Center, Mexico.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/68951>

**Original Research Article**

**Received 16 March 2021**

**Accepted 21 May 2021**

**Published 24 May 2021**

### **ABSTRACT**

**Objective:** To assess the risk factors which determine the magnitude of post-tonsillectomy hemorrhage.

**Study Design:** Prospective cross sectional study.

**Setting:** A study carried out at otolaryngical unit at a tertiary care Isra University hospital Hyderabad, from June 2018 to April 2019.

**Materials and Methods:** 110 pediatric patients age 5-17 years were included in this study. We administered a structured questionnaire to parents of the patients. We selected cases for tonsillectomy as per criteria of the American Academy of Otolaryngology Head and Neck Surgery (AAO-HNS). Those patients with a history of recurrent tonsillitis presented at the otolaryngology department were included. Patients with a history of use of anticoagulant therapy, obstructive sleep apnea, patients with a history of a bleeding disorder, and patients not giving consent were

\*Corresponding author: E-mail: [amratkumar.ent@gmail.com](mailto:amratkumar.ent@gmail.com);

excluded. We diagnosed patients selected for tonsillectomy included with recurrent tonsillitis, peritonsillar hypertrophy, and tonsillar hypertrophy. Patients were observed and followed for postoperative hemorrhage. Data were analyzed by using Statistical Package for Social Sciences version 21 (SPSS 21).

**Results:** Among 110 children included in the study, 41.8% patients were in the age group of 5-10 years, 30% were in the age group of 11-15 years and 28.2% were over 15 years. Among 110 patients 21.8% underwent tonsillectomy were diagnosed as recurrent tonsillitis, 19% were diagnosed as having tonsillar hypertrophy, 40.0% were suffering from both recurrent tonsillitis and tonsillar hypertrophy and 19.2% had peritonsillar hypertrophy. This shows that 14.5% were admitted to the hospital after 1-5 days, 58.1% developed post-tonsillectomy hemorrhage after 6-10 days and 27.2% developed post-tonsillectomy hemorrhage after 10 days.

**Conclusion:** We conclude that age >10 years was significant predictive risk factors for post-tonsillectomy hemorrhage among children who undergo tonsillectomy.

*Keywords: Tonsillectomy; risk factors; hemorrhage.*

## 1. INTRODUCTION

Tonsillectomy is the most frequently performed surgical procedure in otolaryngology settings all over the world, both in pediatric patients. The frequency of Tonsillectomy procedures accounts for about 20% to 40 percent of all surgeries in otolaryngic units throughout the world. The indications for tonsillectomy include recurrent tonsillitis, hypertrophic tonsils, peritonsillar abscess, and obstructed airway. Post tonsillectomy hemorrhage is a frequent complication associated with morbidity and mortality. We have estimated that incidence of overall hemorrhage because of tonsillectomy is about 4.5%, whereas primary hemorrhage can occur in 0.2-2.5% and incidence of secondary post-tonsillectomy hemorrhage is about 1-3.5%. Post-operative hemorrhage is associated with high morbidity and mortality unless managed properly, depending on prevalent risk factors [1].

Post tonsillectomy hemorrhage poses a higher risk because of its location in upper respiratory tract. It is clear in certain studies that incident of post tonsillectomy hemorrhage occur at the rate of 0.08% to 20%. Some studies in Pakistan have indicated an incidence of secondary post tonsillectomy hemorrhage at a rate of 3 to 5 percent. Other complications associated with tonsillectomy include possibilities of aspiration and pulmonary edema which have been reduced by applying modern techniques of anesthesia. Sometimes, sore infections, throat, fever, uvular edema and otalgia are also reported [2,3].

Some clinical and demographic aspects such as age of patient, gender, surgical technique, use of analgesic, surgical indication and seasonal variation are considered as risk factors for

occurrence of post tonsillectomy hemorrhage. Risk factor which are usually giving predictability of the post tonsillectomy hemorrhage, risk of post tonsillectomy hemorrhage include number of factors. Few studies have enumerated these conditions. Ordemann AG et al. [4] have revealed that risk of bleeding was significantly higher in children of older age, children operated for the indication of acute and recurrent tonsillitis. In a study by Al Sabeih et al suggested that the risk of bleeding is three times higher in patients with a history of upper respiratory infections compared to patients without upper respiratory infections [5].

Rationale of this study was to assess predictability of post-operative hemorrhage in tonsillectomy in children in local conditions so that it can take preventive measured decrease the potential of this high-risk complication of tonsillectomy among children.

## 2. MATERIAL & METHOD

This was a prospective cross-sectional study carried out at otolaryngical unit at a tertiary care Isra University hospital Hyderabad, from June 2018 to April 2019. We administrated a structured questionnaire to parents of the patients. A sample of 110 pediatric patient age 0-13 years were included for this study. We selected cases for tonsillectomy as per criteria of American Academy of Otolaryngology Head and Neck Surgery (AAO-HNS). Those patients with a history of recurrent tonsillitis presented at otolaryngology department were included. Patients with history of use of anticoagulant therapy, obstructive sleep apnea, patients with a history of bleeding disorder and patients not giving consent were excluded. They diagnosed

patients selected for tonsillectomy included with recurrent tonsillitis, peri-tonillar hypertrophy and tonsillar hypertrophy. Patients were observed and followed for post-operative hemorrhage. Data was analyzed by using Statistical Package for Social Sciences version 21. Qualitative data was analyzed by applying frequencies and percentages and for quantitative data, mean and standard deviation were used. For calculation of association, chi-square was applied with p value of 0.05.

### 3. RESULTS

Age of patients included in this study were assessed which shows that 41.8% patients were in age group of 5-10 years, 30% were in age group of 11-15 years and 28.2% were over 15 years (Range 5-17 years). In this study, 56.3% were male children and 43.7% were females. Among 110 patients 21.8 % underwent tonsillectomy were diagnosed as recurrent tonsillitis, 19% were diagnosed as having tonsillar hypertrophy, 40.0% were suffering from both recurrent tonsillitis and tonsillar hypertrophy and 19.2% had peritonsillar hypertrophy (Table.1).

Table 2 shows the hospitalization time of the patients before and after surgery which shows that 60.1% were hospitalized for 24 hours, 24.5% were hospitalized up to 48 hours and 15.4% were hospitalized for over 48 hours. Patients who were readmitted after complain of post tonsillectomy hemorrhage were assessed. 10.9% patients were hospitalized after 24 hours of tonsillectomy surgery, 37.27% were readmitted for 48 hours and 51.8% were hospitalized for more than 48 hours (Table.2).

Fig. 1 show that assessment which indicates that 14.5% were admitted to hospital after 1-5 days, 58.1% developed post tonsillectomy hemorrhage after 6-10 days and 27.2 % developed post-tonsillectomy hemorrhage after 10 days. Table 3 shows association of post tonsillectomy hemorrhage with diagnosis between age groups, chi square was 0.04, which shows there was a significant association between age groups and post tonsillectomy hemorrhage.

### 4. DISCUSSION

Complications associated with tonsillectomy can be primary or secondary. Primary complications are related to operative techniques, which occur

within 24 hours of surgery. Secondary post tonsillectomy hemorrhage (PTH) occurs after 24 hours of surgery. Secondary post tonsillectomy hemorrhage (PTH) occurs after 24 hours of surgery. They have attributed risk factors with secondary complications. They attributed risk factors to Post tonsillectomy hemorrhage. We have cited complications in literature such as spain, hypovolemia because of insufficient fluid intact, blood lost, infection and hemorrhage are troublesome in adults and in children. Number of studies have cited a prevalence of post tonsillectomy hemorrhage from 0.1 to 40percent, depending upon predictive risk factor. They have revealed prevalence of Post tonsillectomy hemorrhage in literature between 1 to 3 percent in primary Post tonsillectomy hemorrhage [6]. We assessed the complication of post tonsillectomy hemorrhage in this research and I found that in 21.8% patients who were admitted for tonsillectomy had Post tonsillectomy hemorrhage. The frequency of Post tonsillectomy hemorrhage was in accordance to Windfuhr JP et al. [7].

In this study, time period of occurrence of post tonsillectomy hemorrhage was assessed, and the result revealed that majority of the cases of Post tonsillectomy hemorrhage on fifth day. There was no significant difference in frequency of post tonsillectomy hemorrhage among different age groups. There was also no significant difference of frequency of PTH gender wise distribution which is in accordance to study by Venkatesan NN et al. [8].

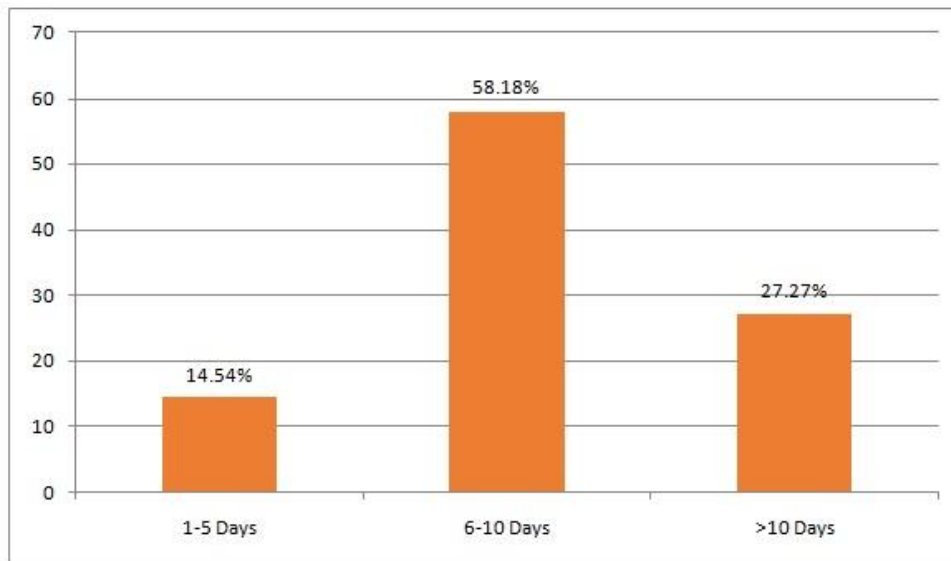
Few studies have shown that also associated indications for the tonsillectomy with various frequencies of post tonsillectomy hemorrhage. While a study in India is not in accordance to result of this research [9]. They establish it from some studies that method of surgery is significantly associated as risk factor for post tonsillectomy hemorrhage. For instance, Mangilia et-al14 found a rate of Post tonsillectomy hemorrhage at 0.2 percent in the patients who underwent cold steel tonsillectomy. Few studies have reported that about 89 percent of the patients were discharged within 24 hours where as, in this study, 10.9% percent were discharged after 24 hours and 37.2% percent in 48 hours while 51.8% percent remained hospitalized for over 48 hours. Amir I et al. [9] have cited the identical number of patients discharged within 48 hours after Post tonsillectomy hemorrhage.

**Table 1. Descriptive statistics**

Variable	Frequency (n)	Percentage (%)
<b>Gender</b>		
• Male	62	56.3%
• Female	48	43.7 %
<b>Age (Years)</b>		
• 5-10	46	41.8 %
• 11-15	33	30.0 %
• 15 and above	31	28.2%
<b>Indication for Tonsilectomy</b>		
• Recurrent tonsillitis	24	21.8%
• Tonsillar hypertrophy	21	19.0%
• Recurrent tonsillitis + Tonsillar hypertrophy	44	40.0%
• Peritonsillar hypertrophy	21	19.2%

**Table 2. Hospitalization before and after surgery n= 110**

Hospitalization	Before surgery		After surgery	
	Frequency	Percentage	Frequency	Percentage
• 24 Hours	67	60.1%	12	10.93%
• 48 Hours	27	24.5%	41	37.27%
• > 48 Hours	16	15.4%	57	51.8%



**Fig. 1. Timing of post tonsillectomy was assessed**

**Table 3. Association of post tonsillectomy hemorrhage with diagnosis between age groups n= 110**

Age group	Recurrent tonsillitis	Hypertrophic tonsillitis	RT+HT	Peritonsillar	P value
• ≤ 10 years	5	5	14	7	0.04
• > 10 Years	20	5	26	14	

RT: Recurrent tonsillitis, HT: Hypertrophic tonsillitis

In this study 14.5% percent reported secondary Post tonsillectomy hemorrhage after 5 days of post-operative time whereas Khan M et-al. [6] reported 5 percent of the patient had post tonsillectomy hemorrhage for 5 to 10 days of post-operative time. A study by Belyea J et-al. [11] has shown prevalence of 17.2 percent of post tonsillectomy hemorrhage. This study also indicated a mean time of post tonsillectomy hemorrhage was 6.1 days with a range of 1-18 days while mean days of hospitalization was 21% hours. In this research, post tonsillectomy was observed in patients of recurrent tonsillitis was also found in 21.8% percent of patients. Belyea J et al. [12] has shown in their findings that there was no significant association of Post tonsillectomy hemorrhage with method of surgery applied for tonsillectomy. In this study, management of Post tonsillectomy hemorrhage required conventional surgery for controlling bleeding while few studies show that up to 23 percent of patients required complex surgery which is in contrast to this study.

## 5. CONCLUSION

We conclude that predictive risk factors for post tonsillectomy hemorrhage among children who undergo tonsillectomy include diagnosis of the patient and age >10 years was significant associated with an increased risk of postoperative haemorrhage. They also associate the risk factors with age factor and outcome of the surgery effects the frequency of post tonsillectomy hemorrhage.

## CONSENT AND ETHICAL APPROVAL

Ethical approval was taken from the ethical review board. Patients' written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Negrn H, Atef A, Lasheen H, Kamel AA, Azooz K, Elhousainy O. Factors affecting secondary post- tonsillectomy hemorrhage: a case-control study. *Egypt J otolaryngol* 2017;33(200):50-2.
2. Achar P, Sharma RK, De S, Donne AJ. Does primary indication for tonsillectomy influence post-tonsillectomy haemorrhage rates in children?. *International Journal of Pediatric Otorhinolaryngology*. 2015 Feb 1;79(2):246-50.
3. Betancourt AR, López C, Zerpa V, Carrasco M, Dalmau J. Does surgical technique influence post-tonsillectomy haemorrhage? Our experience. *Acta Otorrinolaringologica (English Edition)*. 2015 Jul 1;66(4):218-23.
4. Ordemann AG, Hartzog AJ, Seals SR, Spankovich C, Stringer SP. Is weight a predictive risk factor of postoperative tonsillectomy bleed?. *Laryngoscope Investigative Otolaryngology*. 2018 Jun;3(3):238-43.
5. Al Sebeih K, Hussain J, Albatineh AN. Postoperative complications following tonsil and adenoid removal in Kuwaiti children: a retrospective study. *Annals of Medicine and Surgery*. 2018 Nov 1;35:124-8.
6. Khan MA, Khan ZU, Akram S, Rafique U, Usman HB. Comparison of postoperative pain and hemorrhage in children after tonsillectomy with bipolar diathermy technique versus tonsillectomy with cold steel dissection and silk ligature. *Pakistan Armed Forces Medical Journal*. 2015 Dec 31;65(6):739-42.
7. Ulualp SO. Rate of post-tonsillectomy hemorrhage after elective bipolar microcauterization of nonbleeding vessels. *European Archives of Oto-Rhino-Laryngology*. 2012 Apr;269(4):1269-75.
8. Tolska HK, Takala A, Pitkaniemi J, Jero J. Post-tonsillectomy haemorrhage more common than previously described—an institutional chart review. *Acta Oto-Laryngologica*. 2013 Feb 1;133(2):181-6.
9. Perkins JN, Liang C, Gao D, Shultz L, Friedman NR. Risk of post-tonsillectomy hemorrhage by clinical diagnosis. *The Laryngoscope*. 2012 Oct;122(10):2311-5.
10. Amir I, Belloso A, Broomfield SJ, Morar P. Return to theatre in secondary post-tonsillectomy haemorrhage: a comparison of coblation and dissection techniques. *European Archives of Oto-Rhino-Laryngology*. 2012 Feb;269(2):667-71.
11. Alm F, Stalfors J, Nerfeldt P, Ericsson E. Patient reported pain-related outcome measures after tonsil surgery: an analysis of 32,225 children from the National Tonsil Surgery Register in Sweden 2009–2016. *European Archives of Oto-Rhino-*

- Laryngology. 2017 Oct;274(10):3711-22.
12. Belyea J, Chang Y, Rigby MH, Corsten G, Hong P. Post-tonsillectomy complications in children less than three years of age: A case-control study. International Journal of Pediatric Otorhinolaryngology. 2014 May 1;78(5):871-4.

---

© 2021 Kumar et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<http://www.sdiarticle4.com/review-history/68951>